OFFICE MEMO

TO: Paul Hutton	**DATE:** September 17, 2001
	SUBJECT: Delta Wetlands Preliminary Delta Simulation Model 2 (DSM2) Studies
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Introduction

Several 16-year DSM2 planning studies were simulated using the same hydrology and project island operations used for the Delta Wetlands EIR. These simulations provided output that showed the effects of the Delta Wetlands operations on Electrical Conductivity (EC), ultraviolet absorbance at 254 nm (UVA), dissolved organic carbon (DOC), Total Trihalomethane (TTHM), and Bromate (BRM). The purpose of doing these studies was: to evaluate the Delta Wetlands proposed operation, to establish a way to evaluate transport and fate of constituents not normally modeled in a planning study, and to set up studies so that the template would be ready for the more refined in Delta storage simulations.

These studies include an existing Delta condition with no Delta Wetland project islands in operation and a plan condition with the project islands in operation. Results and analyses for both conditions are shown in the attached report, and a brief summary of major findings is listed below.

Description of Simulations

Both the base and plan condition used a DWRSIM 771 hydrology for the boundary inflows and exports. In the plan hydrology, water was diverted onto the project islands when the Delta was in excess flow conditions. Water was pumped into the channels from the islands when the Delta was in balance and when there was pumping capacity available. For both the base and the plan conditions, simulations were run using three different constituents, EC, UVA and DOC. TTHM and BRM values were calculated from relationships between DOC, UVA, EC, and temperature. (Average monthly temperatures were obtained from the Contra Costa water treatment plant and used in the relationship).

The EC quality of water returned to the channels from the project island reservoirs was a mixture of the various diversion qualities found in the project islands. Since there is uncertainty concerning the DOC and UVA water quality leaving the islands due to the interaction of the water with the island, the return quality for DOC and UVA was set at three different levels in order to provide bookend results. The return values are listed in the table below.

Bookend Simulation	DOC (mg/L)	UVA (cm^{-1})
Low	6	0.289
Middle	15	0.686
High	30	1.348

Results

Results for the base and plan were compared with each other and with the water quality constraints defined in the Delta Wetlands Water Quality Management Plan (WQMP). Output results were given at four urban intake locations: Old River at Rock Slough, Old River at Los Vaqueros Intake, the intake for the State Water Project and the Intake for the Central Valley Project. Listed below are the major

findings.

- The DSM2 EC simulations, which used the DWRSIM 771 hydrology, gave results that exceeded the Rock Slough Chloride standard for both base and plan conditions during most winters in the 16-year simulation period. Therefore the modeled EC and the calculated TTHM and BRM at the urban intakes is suspect for the Delta Wetlands Alternative and should not be analyzed in an absolute sense.
- There was little difference in modeled EC between the base and plan conditions.
- Agricultural returns for the project islands in the base condition have a very small effect on DOC at urban intake locations.
- DOC results from the DSM2 base case frequently exceeded the 4-mg/L DOC water quality constraint during the spring runoff periods.
- Results for the simulations with the mid and high DOC releases from the project islands exceeded the 4 mg/l DOC water quality constraint at all of the urban intake locations. Water releases typically occurred during the summer.
- Results from the simulations with the low DOC concentration release from the project islands did not exceed the 1-mg/l increase water quality constraint but approached it at the Los Vaqueros intake on Old River.
- The long-term DOC trend results showed that the low DOC concentration release decreased the DOC mass loading at all four urban intake locations. Results from the high and mid DOC concentration releases exceeded the WQMP 5% increase in DOC mass loading limit.
- Output for UVA showed trends similar to those discussed above for DOC.